REMARKS

I. Summary of the Examiner's Action

A. Claim Rejections

Claim 12 stands rejected under 35 U.S.C. § 112, first paragraph, as failing to comply with the enablement requirement.

Claims 1, 2, 20, 21 and 22 stand rejected under 35 U.S.C. § 102(e) as being anticipated by United States Patent No. 6,625,750 to Duso *et al.* (hereinafter "the Duso patent").

Claims 1 and 5 stand rejected under 35 U.S.C. § 102(b) as being anticipated by United States Patent Application Publication No. US 2001/0001563 A1 to Tomaszewski (hereinafter "the Tomaszewski application").

Claim 3 stands rejected under 35 U.S.C. § 103 (a) as being unpatentable over the Tomaszewski application in view of United States Patent No. 6,622,178 to Burke *et al.* (hereinafter "the Burke patent").

Claim 4 stands rejected under 35 U.S.C. § 103 (a) as being unpatentable over Tomaszewski in view of Burke and further in view of "On-The-Go Supplement to the USB 2.0 Specification Revision 1.0a" of Chandler *et al.* (hereinafter "the Chandler USB 2.0 reference").

Claims 6, 7, 11, 13, 14, 15, 16, 24 and 25 stand rejected under 35 U.S.C. § 103

(a) as being unpatentable over the Burke patent in view of the Chandler USB 2.0

reference.

Claims 17, 18, 19, 23 and 26 stand rejected under 35 U.S.C. § 103 (a) as being

unpatentable over the Tomaszewski patent in view of the Chandler USB 2.0

reference.

B.   Allowable Subject Matter

The Examiner objected to claims 8 – 10 as being dependent upon a rejected

base claim, but indicated that the claims would be allowable if rewritten in

independent form including all the limitations of the base claim and any intervening

claim.

II.   Applicant's Response – Amendment of Specification and Claims

Applicant has made amendments to the specification and the claims. In

particular, the amendments to the specification are made to correct several

typographical and grammatical errors which are apparent from the context of the

disclosure, and to conform the specification to changes made to the claims. No new

matter has been added to the specification.

Amendments made to the claims are not made for the purposes of patentability

but to improve the overall quality of the claims. The claims as originally presented,

and as currently amended, are patentable over the art of record, whether taken singly

or in combination. No new matter has been added to the claims.

III. Applicant's Response - Rejection of Claim 1 under 35 U.S.C. § 112, first paragraph

In the November 9 Office Action the Examiner alleges that claim 12 is not

described in the specification in a way so as to enable one skilled in the art to make

and/or use the invention. Claim 12 relates to an identifier contact that identifies

whether the interface is connected to a peripheral or a host device. Page 5, lines 20 –

24 of the description state that "a mini A-plug connects, when inserted, the fourth pin

contact 46 (GND) to the fifth pin contact 48 (ID) via resistor. A mini B-plug, when

inserted, leaves the fifth pin contact 48 (ID) isolated." From this section it is clear to

a person skilled in the art that by monitoring whether the ID pin 48 is isolated or

connected to ground, the interface can determine whether a connected device is a

peripheral (B-plug) or a host (A-plug). Page 9, lines 6 – 10 and FIGS. 1 and 2 also

show how the identifier contact identifies whether the interface is connected to a

peripheral or a host.

IV. Applicant's Response – Prior Art Rejections

A. Applicant's Invention

Applicant's invention concerns an interface both that allows a device

incorporating the interface to function as either a default host or a default peripheral

when the device is connected to a serial data communication bus, and that allows

power to be removed from Vbus in order to save energy, while maintaining the ability

to determine if a device is disconnected or a new device is connected. The interface

in embodiments of the invention checks for a connection by periodically starting a session if a device incorporating the interface is connected as a host or by periodically requesting a session if the device incorporating the interface is connected as a peripheral.

It is advantageous to remove power from Vbus in a mobile device when a data communication session is no longer required as this prolongs the battery life of the mobile device. However, with power removed from Vbus it is not possible to determine if a device is disconnected or a new device is connected to the serial data communication bus. Embodiments of the present invention overcome this problem by utilizing a novel and non-obvious implementation of existing protocols in order to check for the connection/disconnection of a device. The use of the existing protocols in a periodic way allows power to be removed from Vbus while still maintaining the ability to detect connection/disconnection. Using existing protocols is advantageous as it eliminates the need for additional circuitry, additional protocols or additional contacts to be implemented.

B.   Prior Art Rejections Under 35 U.S.C. §§ 102(e) and 102(b)

Claim 1, as amended, is reproduced here as a convenience to the Examiner:

1.   An interface connectable as a default host interface to a peripheral or as a default peripheral interface to a host, for serial data communication between a host and a peripheral during a session, and comprising:

automated means for periodically checking a connection by periodically starting a session when connected as a default host interface and

automated means for periodically checking a connection by periodically requesting a session when connected as a default peripheral interface.

It is not seen where the Duso patent or Tomaszewski application either describe or suggest the subject matter of claim 1, whether taken singly or in combination.

The Duso patent discloses a file server system with failover services for resuming interrupted operations of a failed processing unit with little or no client involvement. The file server system comprises two control servers 28, 29, multiple stream servers 21 and storage 23. The master control server 28 is active and controls the stream servers 21. The slave control server 29 is inactive and is programmed to respond automatically to a failure of the active control server 28 to assume the master responsibilities. "Each second a 'heartbeat' signal is sent . . . from the master controller server to the slave controller server and from the slave controller server to the master control server" (Duso patent, Column 51, lines 25 – 29). The heartbeat signal from the master indicates whether or not the master has any failure, if so the slave assumes master status. The heartbeat signal from the slave indicates if the slave has failure, if so the master "calls home" to report the error.

The Duso patent neither describes nor suggests the master server periodically starting a session or the peripheral periodically requesting a session. A session in the context of Applicant's invention would be understood by one skilled in the art to be defined in Chandler et al. "On-The-Go Supplement to the USB 2.0 Specification" (page 37, Section 5.3.1) which states "a session is defined as the period of time Vbus

is above the Session Valid threshold of a given device." The heartbeat signal in Duso

from the master to the slave indicates the operational status of the master, it does not

start a session. The heartbeat signal from the slave to the master indicates the

operational status of the slave, it does not request a session.

The Tomaszewski application discloses a method for controlling the mode of

operation of a digital camera depending on whether the camera is tethered to a

computer or not. The camera has a camera manager 501 that includes a Vbus signal

checker 500 which periodically polls a Vbus bit 508 in the software readable register

207. The Vbus bit 508 is asserted when a Vbus signal is detected on Vbus line 200.

When the Vbus bit indicates the presence of the Vbus signal, the camera operates in

the tethered mode.

Tomaszewski only discloses a USB cable 106 in which one end connects to a

peripheral port 107 and the other end connects to a host port 108. Tomaszewski does

not disclose "an interface connectable as a default host interface to a peripheral or as a

default peripheral interface to a host."

The Tomaszewski application also does not disclose "automated means for

periodically checking a connection by periodically requesting a session when

connected as a default peripheral interface." Tomaszewski polls a Vbus bit, it does

not request the computer to start a session as Vbus must already be powered by the

computer upon connection of the camera. If Vbus was not powered, upon connection,

the camera would not be able to determine if it was tethered to the computer as the absence of the Vbus signal would cause the camera to operate in portable mode.

There is no disclosure or suggestion in Tomaszewski of "automated means for periodically checking a connection by periodically starting a session when connected as a default host interface". The host interface (computer) in Tomaszewski must be continually providing power to Vbus in order for the peripheral interface of the camera to detect if it is tethered to the computer, as discussed above.

Tomaszewski requires additional hardware over and above the standard protocols in order to detect whether the camera is tethered to the computer or not. This is clearly different from Applicant's invention which utilizes existing protocols for starting a session and requesting a session for detecting the connection/disconnection of a device.

United States Patent No. 6,898,652 to Peters *et al.* (hereinafter "the Peters patent") and Compaq *et al.* "Universal Serial Bus Specification 2.0" (hereinafter "the Compaq USB 2.0 Specification") do not remedy the deficiencies of the Duso patent and Tomaszewski application, whether taken singly or in combination. The Peters patent discloses that ". . . the host periodically polls each attached USB hub device to determine the state of each hub's active down stream ports" (Peters patent, Column 1, lines 20 – 22). Peters continues, "the hub determines the attachment and detachment of devices . . . the hub then sets bits in its status register indicating any changes to its ports. The host subsequently reads the status register on the next poll period" (Peters

patent, Column 1, lines 25 – 30). Therefore, Peters discloses that the attachment/detachment of devices to a hub is determined by the host periodically polling a status register in the hub. Peters does not disclose that a connection is periodically checked by the host interface periodically starting a session.

Peters also does not disclose an "interface connectable as a default host interface to a peripheral or as a default peripheral interface to a host", or "automated means for periodically checking a connection by periodically requesting a session when connected as a default peripheral interface".

The Compaq USB 2.0 Specification discloses that "hubs have status bits that are used to report attachment or removal of a USB device on one of its ports. The host queries the hub to retrieve these bits" (page 20, section 4.6.1). Like Peters, this document does not disclose that a connection is checked by the host interface periodically starting a session. The host interface only polls a status bit in the hub.

The Compaq USB 2.0 Specification also does not disclose an "interface connectable as a default host interface to a peripheral or as a default peripheral interface to a host", or "automated means for periodically checking a connection by periodically requesting a session when connected as a default peripheral interface".

For the foregoing reasons, Applicant respectfully submits that claim 1 is patentable over the references of record. Applicant therefore respectfully requests that the Examiner withdraw the rejection of claim 1. Independent claim 22 is

patentable for reasons similar to claim 1. Applicant therefore respectfully requests

that the Examiner withdraw the rejection of claim 22. Claims 2 and 5 are patentable

as depending from allowable base claims and for reasons attributable to their unique

features. Applicant therefore respectfully requests that the rejection of claims 2 and 5

be withdrawn as well. Claims 20 and 21 have been cancelled and so their rejection is

moot.

C.   Prior Art Rejections Under 35 U.S.C. § 103(a)

The Burke patent discloses a system for restoring a computer from suspend

mode on detecting a stimulus from a USB device. The computer system 10 contains a

USB host interface 20, a USB hub 16 and USB peripherals 15, 19. The Host interface

20 contains a wake-up controller 34 that is operable to periodically enable a

controllable power supply 32 to power Vbus. "The wake-up controller then polls the

USB peripheral using a secondary non-USB protocol. If a wake-up stimulus has been

received by the peripheral . . . wake-up controller 31 wakes up computer system 10"

(Burke patent, Column 4, lines 36 – 42).

Burke only discloses a USB host interface 20 with connected peripherals via a

USB Hub. It does not disclose an "interface connectable as a default host interface to

a peripheral or as a default peripheral interface to a host".

The host interface in Burke does not check for disconnection by detecting the

absence of a reply signal. The wake up controller polls the peripheral to see if a wake

up stimulus has been received. If it has, the wake-up controller wakes up the

computer, if not the computer remains in suspend mode awaiting a stimulus from the peripheral. Burke does not disclose a peripheral interface that periodically requests a session.

In Burke, the wake-up controller periodically enables controllable power supply 32 to power Vbus. The wake up controller then polls the peripheral using a second, non-USB protocol. Burke requires a separate and distinct protocol that is not standard to a USB device in order to poll the peripheral for a received wake-up call stimulus. Burke therefore teaches away from embodiments of the present invention because the present invention utilizes existing protocols to detect connection/disconnection.

The Chandler USB 2.0 Specification discloses that in order to conserve power, an A-device can leave Vbus turned off when the bus is not being used. A B-device can use a session request protocol (SRP) to request an A-device to supply power on Vbus to start a session. Chandler discloses that the SRP is used for requesting an A-device to turn Vbus on, not for checking if a device is connected. Chandler does not disclose that a B-device periodically uses the SRP. Therefore, there is no disclosure or suggestion in Chandler of using the SRP for periodically checking a connection.

There would be no motivation to modify the prior art to fall within the scope of the present invention because all the prior art documents that provide some method of detecting connection/disconnection, do so by means of additional protocols or specific circuitry within the devices. Embodiments of the present invention provide

the advantage of using existing protocols designed for starting a session, or for requesting a session in order to automatically detect the connection/disconnection of devices. No specific new circuitry is needed to implement embodiments of the present invention. Embodiments of the present invention allow Vbus to be turned off when not required, thus saving battery power, but still maintaining the ability to detect connection/disconnection of devices. None of the prior art documents provide these advantages.

A set forth in the foregoing explanation, the Burke patent and Chandler USB 2.0 Specification do not remedy the deficiencies of the Tomaszewski application. Accordingly, claims 3 and 4 are patentable over the references of record, whether taken singly or in combination, since claims 3 and 4 depend from an allowable base claim.

The Examiner alleges that claim 6 is obvious in view of Burke and Chandler. There would be no motivation to combine the teachings of Burke and Chandler, because Burke teaches away from embodiments of the present invention. As discussed above, one of the advantages of embodiments of the present invention is that existing protocols are used to determine connection/disconnection of a device. Burke requires a new, non-USB protocol in order to poll the peripheral for a received wake up stimulus. This is clearly contrary to the teachings of the present invention. Therefore, any combination of the documents must be as a result of hindsight reasoning. Claim 6 is therefore not obvious. Claim 24 is non-obvious for similar reasons.

The Examiner alleges that claim 15 is obvious in view of Burke and Chandler. There would be no motivation to combine Burke and Chandler for the same reasons as set forth above. Even if the documents were combined, the combination would not fall within the scope of the claimed invention because in Burke the host interface does not check for disconnection by detecting the absence of a reply signal. The wake-up controller polls the peripheral to see if a wake up stimulus has been received. If it has, the wake up controller wakes up the computer, if not the wake up controller receives an indication that there is no stimulus and the computer remains in suspend mode awaiting a stimulus from the peripheral. Claim 15 is therefore not obvious. Claim 25 is non-obvious for similar reasons.

The Examiner alleges that claim 17 is obvious in view of Tomaszewski and Chandler. Tomaszewski does not disclose detection means for detecting the absence of a reply signal. In Tomaszewski the camera manager periodically polls the Vbus bit to check for a connection. The Vbus bit indicates whether the camera is tethered to the computer or not. Therefore, Tomaszewski determines disconnection by receiving a reply from the Vbus bit indicating that Vbus is disconnected, not by the absence of a reply signal. Therefore, even if the documents were combined, the combination would not fall within the scope of the present invention. Therefore claim 17 is non-obvious. Claim 26 is non-obvious for similar reasons.

For the foregoing reasons, Applicant respectfully submits that dependent claims 3 and 4, and independent claims 6, 15, 17, and 23 – 26 are patentable over the art of record, whether taken singly or in combination. Applicant therefore

respectfully requests that the Examiner withdraw the rejection of claims 3, 4, 6, 15, 17

and 23 – 26. Applicant also respectfully requests that the Examiner withdraw the

rejection of claims 7, 11, 13, 14, 16, 18 and 19 both as depending, either indirectly or

directly, from allowable base claims and for reasons relating to their novel and non-

obvious features.

V.   Conclusion

Applicant submits that in light of the foregoing remarks and amendments the application is now in condition for allowance. Applicant therefore respectfully requests that the outstanding rejections be withdrawn and that the case be passed to issuance.

Respectfully submitted,

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Date

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